

# RADIO

## DO NOT DESPISE CRYSTAL DETECTOR

It Is Dependable and Cheap and Every Amateur Receiving Set Should Have One.

There is considerable to know about the crystal, and a little knowledge will enable the operator to get better results and bring increased respect for this instrument. There are many reasons for the longing of the owner of a crystal receiving set for the vacuum tube outfit. However, he has a great many advantages which the owner of the more expensive outfit does not possess.

For instance, the crystal reproduction of the radiophone broadcasting is of the best possible quality. The action being only rectifying there is no chance of distortion. The tube receiver nearly always distorts to some extent. If maximum regeneration is used, even though the tube is not allowed to oscillate, distortion is bound to result. Transformer or choke coil coupling between amplifiers, no grid bias or wrong grid bias, poorly matched tubes and transformers or bad loud talker will all cause distortion. A combination of several of these often causes very great distortion.

When the crystal receiver is out of commission it does not take a genius to locate the trouble. The circuit and the adjustments are simple. A burned out tube means \$5.00 or more for another. A bad crystal means a little

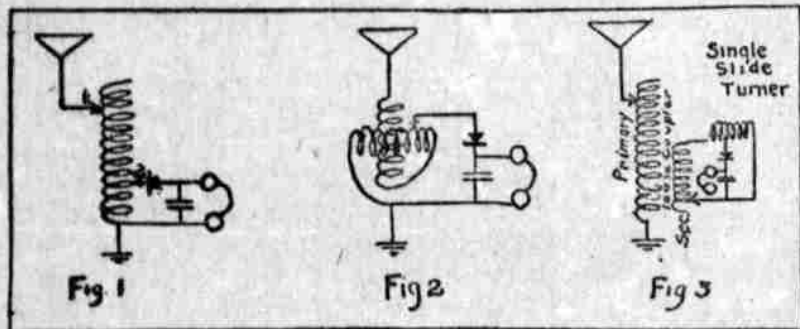
some trouble in one of a dozen pieces of your apparatus. During these periods there is usually some talk that you would like to have heard or a particular concert. A crystal detector will fill in these blanks very well, and you will be surprised at the quality of the music our broadcasting stations are sending out when you hear it via the crystal instead of at the noisy end of a two-step amplifier.

Many of the so-called disadvantages of the crystal detector can be partially overcome.

Crystal receivers usually tune broadly; that is, a small change in tuning does not cause a very great change in signal strength, and a station can be heard over quite a range of tuning. This means that if two stations are sending and their wave lengths are not very far apart it will be impossible to tune one in and exclude the other, whereas if the receiver tunes sharply, a station will be heard over a very narrow band of wave lengths. In other words, a very few degrees either way from the point where the best audibility is obtained will tune the station out. Then some selectivity can be had between two stations even if separated only by a few meters with a sharply tuned receiving set.

The crystal in the usual hookup introduces a resistance into the oscillating circuit, causing that circuit to be somewhat aperiodic. That is, it will respond to more than one wave length.

It is rather hard to tune sharply with a crystal and a single tuning coil. In this case the crystal must be shunted across at least a part of the inductance and there is no way of keeping it entirely out of any of the circuits which may be used. In order to keep it as sharply tuned as possible, it is best to reduce the number of turns shunted by the detector circuit as low as possible without sacrificing too much signal strength. If the circuit shown in Fig. 1 is used, the



trouble to clean it up or at the worst a dime for a new one. The crystal set does not go out of commission periodically as the tube set does, due to a worn out battery.

The crystal set is quiet in action, adding no noise of itself, as do many of the detector tubes. Reception through static is nearly always more easily accomplished with a crystal. The atmospheric seem to be brought in all out of proportion to the signal by the tube detectors, while the crystal seems to damp out the high voltage peaks of the static or strays to some extent, leaving the signals, which are strong enough for it to rectify audibly, very clear.

The crystal set has numerous disadvantages, of course, but so has the vacuum tube, and the good points of the former greatly overbalance its faults.

It is not very stable, a slight jar often being sufficient to "knock out" a good point. There is no way in which a crystal may be made to amplify and it does not give sufficient signal strength to use with a loud talker. It usually causes broad tuning, which makes it difficult to tune out interference. It is not as sensitive to faint signals as the vacuum tube, although it is surprisingly sensitive when properly adjusted. Adjusting the crystal is a tedious task, and it has become especially so since the labor-saving vacuum tubes have become so numerous.

A crystal detector should be included in every receiving set. It is dependable, cheap, and takes up little space. Even though you have a two-step amplifier and a loud talker with all the trimmings, you will admit that there are numerous times when your receiver is out of commission because of a bad A or B battery, dead tube or

number of turns between slider 2 and ground should be kept less than a third of the number between slider 1 and ground. This will allow the antenna circuit to oscillate much more freely at its natural period. If using a single variometer better tuning may be had by tapping off the detector circuit, as in Fig. 2, about three-fourths of the stationary coil of the variometer instead of hooking it across the entire variometer.

The loose coupler is very much to be preferred over either of these two tuning schemes. The two circuits are loosely coupled to each other by induction and both circuits will have a higher resistance to any but the wave length to which they are tuned, each tending to damp out the undesired signal. The crystal is causing rather broad tuning in the secondary circuit, but the antenna circuit with it is rather broad in low resistance, is left to oscillate freely, and will be sharply tuned. This will exclude to a great extent signals on any but the desired wave length. These signals, if induced into the secondary at all, will be greatly weakened. The secondary though broadly tuned, will still have a greater resistance to any signals not on its own natural wave length.

The secondary circuit can be made still more selective by carrying out the same scheme as in the first two figures, that is, by connecting the crystal across only a part of the circuit.

Sharp tuning cannot be obtained with any ordinary outfit between local station even with a vacuum tube detector; it is almost impossible with a crystal, but can be done with a tube outfit by using very loose coupling to the antenna circuit or by using a loop to pick up the signals.

## PROCEEDINGS OF THE BOARD OF SUPERVISORS

(Continued from page three.)

### GENERAL ELECTION RETURNS

PRECINCTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	Total
Sam Tanner (D)	21									10												31
Constable, Justice Precinct No. 3.																						
Frank Smithson (D)	6									3												9
Wm. F. Lee, Jr. (D)	18																					18
Frank Lee (D)										7												7
O. W. Keese (D)	2																					2
Justice of the Peace, Precinct No. 5.																						
S. H. Walker (D)	19	126																				145
For Constable, Justice Precinct No. 5.																						
W. F. Tidwell (D)	17	85																				102
R. S. Johnson (R)	8	82																				90
Justice of the Peace, Precinct No. 6.																						
G. B. Allen (D)	3					48										3						67
Ethel Cole (D)	16					136										26						222
C. D. Haynie (R)	9					29										2						43
Justice of the Peace, Precinct No. 6.																						
M. Alfred Taylor (D)	18					163										17						234
Platt Curtis (D)						2																2
L. L. Follett																						2
For Justice of the Peace, Precinct No. 7.																						
H. L. Colvin (D)						81										31				22		134
For Constable, Justice Precinct No. 7.																						
Carl Bryce (D)						40										15				23		78
T. J. Rex (R)						63										23				3		89
For Justice of the Peace, Precinct No. 8.																						
Miles L. Wood (R)						58				18						33						109
W. G. Martin (N. P.)						1																1
O. W. Banta (N. P.)						2																2
J. E. Shrode (R)						3																3
H. W. Nichols (D)																1						1
For Constable, Justice Precinct No. 8.																						
Bryan Whalen (D)						40				18						34						92
Dan Oliver (R)						18										1						19
W. G. Martin (N. P.)										1												1
O. W. Banta																				6		6
For Justice of the Peace, Precinct No. 9.																						
R. C. Haby (D)						56																56
For Constable, Justice Precinct No. 9.																						
Jim Kennedy (D)						37																37
John F. Greenwood (R)						27																27
For Justice of the Peace, Precinct No. 12.																						
D. D. Phillips (D)																256						256
For Constable, Justice Precinct No. 12.																						
Willis Daily (D)																135						135
W. E. Posey (R)																185						185
For Justice of the Peace, Precinct No. 13.																						
Anton Christensen (D)																41						41
John Hawkins (D)																1						1
Isaac Palmer (D)																6						6
Jess Layton (R)																1						1
For Constable, Justice Precinct No. 13.																						
J. D. Busby (D)																29						29
Jess M. Layton (R)																11						11
J. N. Hawkins (D)																12						12
C. M. Lee (D)																3						3
For Justice of the Peace, Precinct No. 14.																						
Fritz Wolf (D)																7						7
For Constable, Justice Precinct No. 14.																						
Geo. W. Sanford (D)																7						7
For Justice of the Peace Precinct No. 15.																						
S. P. Jenkins (D)																108						108
For Constable, Justice Precinct No. 15.																						
Ben Tenney (D)																51						51
Marion King (D)																1						1
A. J. Shiftlet (D)																2						2

### PROPOSED AMENDMENTS TO THE CONSTITUTION

For Proposed Constitutional Amendment 100 (Yes)	100	0	0	1	13	11	8	12	3	2	1	27	2	0	1	20	1	1	14	0	2	219
For Proposed Constitutional Amendment 101 (No)	245	30	17	16	93	147	68	22	31	9	16	174	35	7	93	13	30	29	70	18	42	1205
For Proposed Constitutional Amendment 102 (Yes)	61	0	4	1	5	17	4	11	1	2	1	25	2	0	2	3	2	0	5	2	4	152
For Proposed Constitutional Amendment 103 (No)	258	26	17	17	161	139	72	29	31	9	17	159	29	7	91	20	30	34	76	16	44	1222
For Proposed Constitutional Amendment 300 (Yes)	56	6	3	1	5	35	37	9	9	2	23	22	0	0	12	12	03	9	09	3	181	
For Proposed Constitutional Amendment 301 (No)	235	21	13	13	93	116	67	24	271	0	14	148	23	7	87	10	26	28	73	16	42	1093
TOTAL VOTE CAST	600	46	57	311	78	256	107	79	68	23	20	347	73	9	123	51	48	47	180	28	64	2435

Having canvassed the returns of the said General Election in the form and manner heretofore described, the Board upon motion duly put and carried declared the following named persons elected to the various County and Precinct offices as follows to-wit:

State Senator	Thomas S. Kimball
State Representative, District No. 1	John F. Weber
State Representative, District No. 2	James M. Smith
Sheriff	S. V. Pollock
Judge of the Superior Court	W. R. Chambers
Clerk of the Superior Court	H. L. Payne
Treasurer	Martin Layton
County Attorney	E. L. Spriggs
County School Superintendent	J. A. Woods
Assessor	J. Myron Alfred
Recorder	L. E. Holladay
Supervisor, District No. 1	E. M. Claridge
Supervisor, District No. 3	Marc E. DuBoise
Justice of the Peace, Precinct No. 1	John Bilby
Constable, Precinct No. 1	Earl Morris
Justice of the Peace, Precinct No. 3	Sam Tanner
Constable, Precinct No. 3	Wm. F. Lee, Jr.
Justice of the Peace, Precinct No. 5	S. H. Walker
Constable, Precinct No. 5	W. F. Tidwell
Justice of the Peace, Precinct No. 6	Ethel Cole
Constable, Precinct No. 6	M. Alfred Taylor
Justice of the Peace, Precinct No. 7	H. L. Colvin
Constable, Precinct No. 7	T. J. Rex
Justice of the Peace, Precinct No. 8	M. L. Wood
Constable, Precinct No. 8	Bryan Whalen
Justice of the Peace, Precinct No. 9	R. C. Haby

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### SUMMONS

IN THE SUPERIOR COURT, OF GRAHAM COUNTY, STATE OF ARIZONA.

Lauvon Rogers, Plaintiff vs. George E. Rogers, Defendant.

Action brought in the Superior Court of the County of Graham, State of Arizona.

The State of Arizona Sends Greetings to George E. Rogers.

You are hereby summoned and requested to appear in an action brought against you by the above named plaintiff and answer the complaint filed with the Clerk of the above-entitled Court, at Safford, in the County of Graham, State of Arizona, within twenty (20) days exclusive of the day of service) after the service upon you of this Summons, if served in this County; in all other cases; within thirty days.

You are hereby notified that if you fail to appear and answer the complaint as required by law, judgment by default will be taken against you.

Given under my hand and Seal of the Superior Court affixed hereto at

Safford, this 9 day of December, 1922.

[Seal] H. L. PAYNE, Clerk.

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